



# PILE FOUNDATION INVESTIGATION FOR ABUTMENTS AND RETAINING WALLS



bureau of electronic data processing



STATE OF NEW YORK  
DEPARTMENT OF PUBLIC WORKS

PILE FOUNDATION INVESTIGATION  
FOR  
ABUTMENTS AND RETAINING WALLS  
PROGRAM NUMBER 2704

Joseph P. Ronan  
Administrative Deputy

J. Burch McMorran  
Superintendent

OCTOBER 1963

NYSDOT  
Library  
50 Wolf Road, POD 34  
Albany, New York 12232



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THE INVESTIGATIVE REPORT

THE

AGENTS AND RETAINING WARD

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PILE FOUNDATION INVESTIGATION  
FOR  
ABUTMENTS AND RETAINING WALLS

PROGRAM NUMBER 2704.02

General

Given a general description of the problem, the program determines the maximum pile load, the vertical pile loads for each pile, the horizontal resistance of the pile groups, the externally applied horizontal load, the center of gravity of the pile group and the eccentricity or distance between the center of gravity of the pile group and the location of the resultant of all the loads. All important design information is listed.

PILE FOUNDATION INVESTIGATION

FOR

RETAINING WALL

PROGRAM NUMBER 7701.02

General

Below a general description of the problem, the program determines the maximum pile load, the vertical pile loads for each pile, the horizontal resistance of the pile group, the externally applied horizontal load, the vector of gravity of the pile group and the eccentricity or distance between the vector of gravity of the pile group and the location of the resultant of all the loads. All important design information is listed.



# SAMPLE OUTPUT

111.000

111.000

|         |        |        |       |        |       |         |
|---------|--------|--------|-------|--------|-------|---------|
| 2.000   | 1.000  | .000   | .000  | 1.000  | 2.000 | 111.000 |
| 1.750   | 4.920  | .000   | .000  | 11.250 | 1.750 | 8.000   |
| 126.380 | 28.520 | 12.950 | 3.170 | 3.000  | 2.000 |         |
| 111.000 |        |        |       |        |       |         |
| 111.000 |        |        |       |        |       |         |

## MAX.VERTICAL PILE LOAD IN KIPS

| PMAX  | ROW 1 | ROW 2 | ROW 3 | ROW 4 | ROW 5 |
|-------|-------|-------|-------|-------|-------|
| 52.52 | 49.83 | 45.20 | .00   | .00   | 35.95 |

HOR.RESIST. EXT.HORIZ. C.G. ECC.

| PILE GROUP | FORCE | PILE GROUP |      |
|------------|-------|------------|------|
| KIPS       | KIPS  | FEET       | FEET |
| 80.28      | 82.10 | 4.91       | .486 |

111.000

|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |

ANALYTICAL DATA

|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |
| 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 | 11.1.11 |

ANALYTICAL DATA

ANALYTICAL DATA

ANALYTICAL DATA

ANALYTICAL DATA

111.000

2.000 1.000 .000 .000 1.000 2.000 111.000

1.750 4.920 .000 .000 11.250 1.750 8.000

135.000 30.000 11.000 3.170 3.000 1.000

111.000

111.000

MAX.VERTICAL PILE LOAD IN KIPS

| PMAX  | ROW 1 | ROW 2 | ROW 3 | ROW 4 | ROW 5 |
|-------|-------|-------|-------|-------|-------|
| 54.52 | 51.73 | 47.54 | .00   | .00   | 39.19 |

HOR.RESIST. EXT.HORIZ. C.G. ECC.

PILE GROUP FORCE PILE GROUP

KIPS KIPS FEET FEET

82.33 69.74 4.91 .417





The moment of inertia method is used in the investigation. The investigation is limited to foundations having a maximum of five (5) rows of piles.

A Fortran listing of the program is attached to define engineering formulae, parameters, methods and sequence of operations.





# FORTRAN LISTING

PROCEDURE NO.2704.02

PILE FOUNDATION INVESTIGATION FOR

ABUTMENTS AND RETAINING WALLS

AT=NO.OF PILES IN ROW 1

BT=NO.OF PILES IN ROW 2

CT=NO.OF PILES IN ROW 3

DT=NO.OF PILES IN ROW 4

ET=NO.OF PILES, IN ROW 5

BAT=NO.OF ROWS OF BATTER PILES

PROB=PROBLEM IDENTIFICATION NUMBER

E1=DISTANCE FROM TOE TO C.L.ROW 1--FEET

CX=DISTANCE FROM TOE TO C.L.ROW 2--FEET

DX=DISTANCE FROM TOE TO C.L.ROW 3--FEET

EX=DISTANCE FROM TOE TO C.L.ROW 4--FEET

BX=DISTANCE FROM TOE TO C.L.ROW 5--FEET

E2=DISTANCE FROM HEEL TO C.L.ROW 5---FEET

POLL=ALLOWABLE HORIZONTAL LOAD PER PILE---KIPS

ZJ=MOMENT ABOUT TOE---FOOT-KIPS

ZV=TOTAL VERTICAL FORCE---KIPS

HF1=TOTAL HORIZONTAL FORCE---KIPS

SPIT=SPACING BETWEEN PILES IN ROW 1---FEET

VERT=VERTICAL COMPONENT OF BATTER PILE

CTR=NO.OF INPUT CARDS FOR ONE PARTICULAR

PROBLEM AFTER CARD NO.3

2 READ7,AT,BT,CT,DT,ET,BAT,PROB



# FORTRAN LISTING

```

      READ7,E1,CX,DX,EX,BX,E2,POLL
      READ7,ZJ,ZV,HF1,SPIT,VERT,CTR
1001 PUNCH7,PROB
      PUNCH7,PROB
      PUNCH7,AT,B1,CT,DT,ET,BAT,PROB
      PUNCH7,E1,CX,DX,EX,BX,E2,POLL
      PUNCH7,ZJ,ZV,HF1,SPIT,VERT,CTR
      PUNCH7,PROB
      PUNCH7,PROB
      PUNCH 9000
9000 FORMAT(//)
      GT=AT+BT+CT+DT+ET
      GTX=GT/AT
      4 CG=(AT*E1+BT*CX+CT*DX+DT*EX+ET*BX)/GT
      6 ECC=CG-ZJ/ZV
      5 IF(CX) 801,800,801
800 D2=0.
      PL2=0.
806 PL3=0.
      D3=0.
807 PL4=0.
      D4=0.
      GO TO 805
801 D2=CG-CX
      IF(DX) 803,806,803
803 D3=CG-DX
      IF(EX) 888,807,888

```





```

888 D4=CG-EX
805 D5=CG-BX
      D1=CG-E1
      T1=D1*D1*AT
      T2=D2*D2*BT
      T3=D3*D3*CT
      T4=D4*D4*DT
      T5=D5*D5*ET
      T=T1+T2+T3+T4+T5
      SP=SPIT*AT
1003 PDL=ZV*SP/GT
      PIM=ZV*SP*ECC/T
      PL1=PDL+PIM*D1
      IF(CX) 811,810,811
811 PL2=PDL+PIM*D2
      IF(DX) 812,810,812
812 PL3=PDL+PIM*D3
      IF(EX) 813,810,813
813 PL4=PDL+PIM*D4
810 PL5=PDL+PIM*D5
      PLMAX=PL1*SQRT(1.+VERT*VERT)/VERT
      IF(PLMAX-PL5) 708,707,707
708 PLMAX=PL5
707 ZZA=1./VERT
      HF1=HF1*SP
      XYZ=POLL*GT+PL1*ZZA*AT
      IF(BAT-2.) 232,233,234

```





# FORTRAN LISTING

```

233 XYZ=XYZ+PL2*ZZA*BT
      GO TO 232
234 IF(BAT-4.) 235,236,236
235 XYZ=XYZ+PL3*ZZA*CT
      GO TO 233
236 XYZ=XYZ+PL4*ZZA*DT
      GO TO 235
232 PUNCH 9

9FORMAT(47H                                MAX.VERTICAL PILE LOAD IN,5H KIPS)
      PUNCH 1
1FORMAT(47H  PMAX          ROW 1      ROW 2      ROW 3      ROW 4,5X,5HROW 5)
      PUNCH8,PLMAX,PL1,PL2,PL3,PL4,PL5
      8 FORMAT(F7.2,5F10.2)
      PUNCH 9000
      PUNCH 10
10FORMAT(37HHOR.RESIST. EXT.HORIZ.   C.G.     ECC.)
      PUNCH 11
11FORMAT(32HPILE GROUP      FORCE      PILE GROUP)
      PUNCH 12
12FORMAT(37H  KIPS          KIPS      FEET      FEET)
      PUNCH 13,XYZ,HF1,CG,ECC
13FORMAT(F8.2,F12.2,F9.2,F9.3)
      PUNCH 9000
      7 FORMAT(8F10.3)
      IF(CTR) 1000,2,1000
1000 READ7,ZJ,ZV,HF1
      CTR=CTR-1.

```



# FORTRAN LISTING

GO TO 1001

END





MADE BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BACK CHECKED \_\_\_\_\_ DATE \_\_\_\_\_  
 BRIDGE \_\_\_\_\_

N.Y.S.D.P.W.

PILE FOUNDATION INVESTIGATION  
 ABUTMENTS AND RETAINING WALLS

SQUAD NO. \_\_\_\_\_  
 JOB NO. \_\_\_\_\_

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

2704.02

## PARITY STOP O FLOW PROGRAM

% STOP SWITCHES 1,2,3,4 OFF

| COL        | 1011                      | 2021                          | 3031                       | 4041                          | 5051              | 6061                          | 70                         |
|------------|---------------------------|-------------------------------|----------------------------|-------------------------------|-------------------|-------------------------------|----------------------------|
| CARD NO. 1 | AT                        | BT                            | CT                         | DT                            | ET                | BAT                           | PROB                       |
|            | NO. PILES - ROW 1         | NO. PILES - ROW 2             | NO. PILES - ROW 3          | NO. PILES - ROW 4             | NO. PILES - ROW 5 | NO. ROWS OF BATTER PILES      | PROBLEM IDENTIFICATION NO. |
|            | EI                        | CX                            | DX                         | EX                            | BX                | E 2                           | POLL                       |
| CARD NO. 2 | TOE TO C.L. ROW 1         | TOE TO C.L. ROW 2             | TOE TO C.L. ROW 3          | TOE TO C.L. ROW 4             | TOE TO C.L. ROW 5 | HEEL TO ROW 5                 | ALLOW. HORIZ. LOAD / PILE  |
|            | Feet                      | Feet                          | Feet                       | Feet                          | Feet              | Feet                          | Kips                       |
|            | ZJ                        | ZV                            | HFI                        | SPIT                          | VERT.             | CTR                           |                            |
| CARD NO. 3 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT | SPACING BETWEEN PILES - ROW 1 | VERT.             | NO. OF CARDS AFTER CARD NO. 3 |                            |
|            | Foot - Kips               | Kips                          | Kips                       | Feet                          |                   |                               |                            |
|            | ZJ                        | ZV                            | HFI                        |                               |                   |                               |                            |
| CARD NO. 4 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |                   |                               |                            |
|            | Foot - Kips               | Kips                          | Kips                       |                               |                   |                               |                            |
|            | ZJ                        | ZV                            | HFI                        |                               |                   |                               |                            |
| CARD NO. 5 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |                   |                               |                            |
|            | Foot - Kips               | Kips                          | Kips                       |                               |                   |                               |                            |
|            | ZJ                        | ZV                            | HFI                        |                               |                   |                               |                            |
| CARD NO. 6 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |                   |                               |                            |
|            | Foot - Kips               | Kips                          | Kips                       |                               |                   |                               |                            |
|            | ZJ                        | ZV                            | HFI                        |                               |                   |                               |                            |
| CARD NO. 7 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |                   |                               |                            |
|            | Foot - Kips               | Kips                          | Kips                       |                               |                   |                               |                            |
|            | ZJ                        | ZV                            | HFI                        |                               |                   |                               |                            |

Cards 4,5,6 and 7 are for additional loading conditions. If moments and forces are reduced, for cases when over stresses are permitted, this reduction must be kept in mind when studying the output of this program.



INPUT IDENTIFICATION

Card No. 1

| <u>Symbol</u> | <u>Field</u> | <u>Explanation</u>          |
|---------------|--------------|-----------------------------|
| AT            | xxxxxxx.xxx  | No. Piles - Row 1           |
| BT            | xxxxxxx.xxx  | No. Piles - Row 2           |
| CT            | xxxxxxx.xxx  | No. Piles - Row 3           |
| DT            | xxxxxxx.xxx  | No. Piles - Row 4           |
| ET            | xxxxxxx.xxx  | No. Piles - Row 5           |
| BAT           | xxxxxxx.xxx  | No. of Rows of Batter Piles |
| PROB          | xxxxxxx.xxx  | Problem Identification No.  |

Card No. 2

|      |             |                                       |
|------|-------------|---------------------------------------|
| E1   | xxxxxxx.xxx | Toe to C.L. Row 1 (Feet)              |
| CX   | xxxxxxx.xxx | Toe to C.L. Row 2 (Feet)              |
| DX   | xxxxxxx.xxx | Toe to C.L. Row 3 (Feet)              |
| EX   | xxxxxxx.xxx | Toe to C.L. Row 4 (Feet)              |
| BX   | xxxxxxx.xxx | Toe to C.L. Row 5 (Feet)              |
| E2   | xxxxxxx.xxx | Heel to C.L. Row 5 (Feet)             |
| POLL | xxxxxxx.xxx | Allow. Horiz. Load per<br>Pile (Kips) |





INPUT IDENTIFICATION

Card No. 3

| <u>Symbol</u> | <u>Field</u> | <u>Explanation</u>                                 |
|---------------|--------------|--|
| ZJ            | xxxxxxx.xxx  | Moment per foot about Toe<br>(Ft-Kips)             |
| ZV            | xxxxxxx.xxx  | Total Vertical Force per<br>Foot (Kips)            |
| HFl           | xxxxxxx.xxx  | Total Horizontal Force Per<br>Foot (Kips)          |
| SPIT          | xxxxxxx.xxx  | Spacing Between Piles -<br>Row 1 (Feet)            |
| VERT          | xxxxxxx.xxx  | Vertical Component of<br>Batter Pile Relative to 1 |
| CTR           | xxxxxxx.xxx  | No. of Cards after Card<br>No. 3.                  |

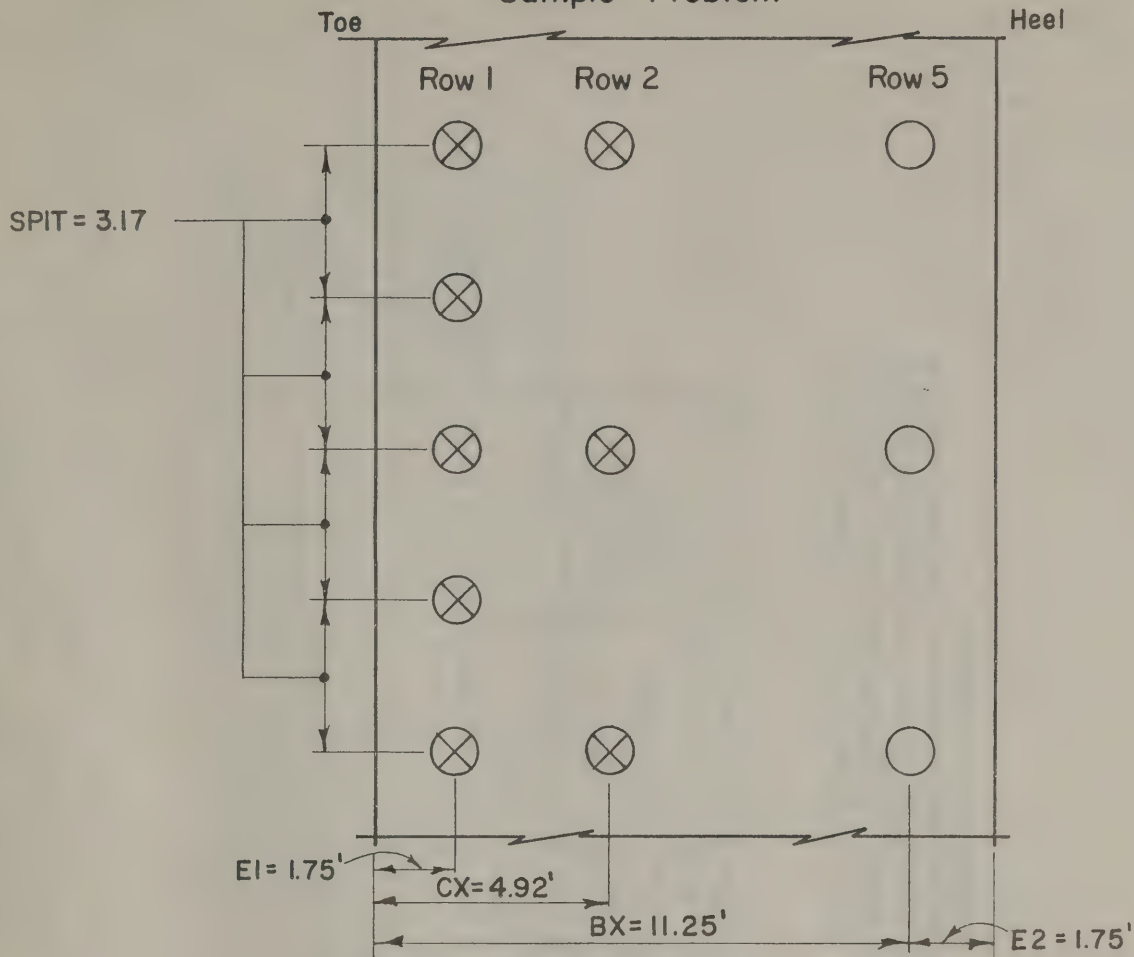
Card No. 4

|     |             |   |
|-----|-------------|---|
| ZJ  | xxxxxxx.xxx | Moment per foot about toe<br>(FT-Kips)    |
| ZV  | xxxxxxx.xxx | Total Vertical Force per<br>Foot (Kips)   |
| HFl | xxxxxxx.xxx | Total Horizontal Force<br>per Foot (Kips) |

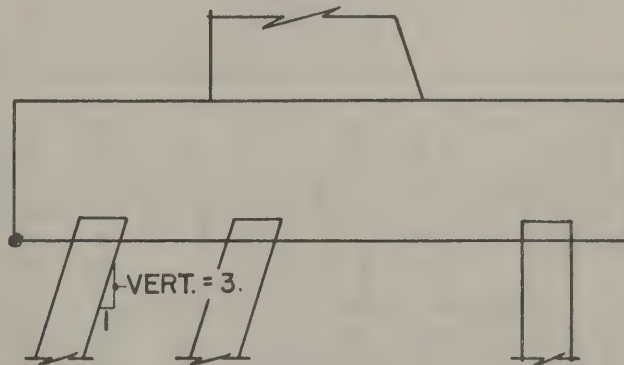
Cards No. 5, 6, 7 etc. have the same input description as Card No. 4.



# Sample Problem



PLAN



SECTION

- ⊗ Denotes Batter Pile
- Denotes Vertical Pile

|    |      |              |         |
|----|------|--------------|---------|
| AT | = 2. | No. of Piles | - Row 1 |
| BT | = 1. | "            | Row 2   |
| CT | = 0. | "            | Row 3   |
| DT | = 0. | "            | Row 4   |
| ET | = 1. | "            | Row 5   |


| NAME | SEX | AGE | HEIGHT | WEIGHT | SKIN | HAIR  | EYES  | TEETH | TOES | FEET   | HAIR  | SKIN | TEETH | TOES | FEET   |
|------|-----|-----|--------|--------|------|-------|-------|-------|------|--------|-------|------|-------|------|--------|
| 1    | M   | 25  | 5' 10" | 150    | Dark | Black | Brown | Good  | 5    | Normal | Black | Dark | Good  | 5    | Normal |
| 2    | F   | 20  | 5' 2"  | 100    | Dark | Black | Brown | Good  | 4    | Normal | Black | Dark | Good  | 4    | Normal |
| 3    | M   | 30  | 6' 0"  | 180    | Dark | Black | Brown | Good  | 6    | Normal | Black | Dark | Good  | 6    | Normal |
| 4    | F   | 25  | 5' 5"  | 120    | Dark | Black | Brown | Good  | 5    | Normal | Black | Dark | Good  | 5    | Normal |
| 5    | M   | 35  | 6' 5"  | 200    | Dark | Black | Brown | Good  | 7    | Normal | Black | Dark | Good  | 7    | Normal |
| 6    | F   | 30  | 5' 8"  | 140    | Dark | Black | Brown | Good  | 6    | Normal | Black | Dark | Good  | 6    | Normal |
| 7    | M   | 40  | 7' 0"  | 220    | Dark | Black | Brown | Good  | 8    | Normal | Black | Dark | Good  | 8    | Normal |
| 8    | F   | 35  | 6' 0"  | 160    | Dark | Black | Brown | Good  | 7    | Normal | Black | Dark | Good  | 7    | Normal |
| 9    | M   | 45  | 7' 5"  | 240    | Dark | Black | Brown | Good  | 9    | Normal | Black | Dark | Good  | 9    | Normal |
| 10   | F   | 40  | 6' 5"  | 180    | Dark | Black | Brown | Good  | 8    | Normal | Black | Dark | Good  | 8    | Normal |

MADE BY T.P. DATE 10/1/63  
CHECKED BY B.G. DATE 10/1/63  
BACK CHECKED S.A.W. DATE 10/1/63  
BRIDGE Castle Creek

N.Y.S.D.P.W.  
PILE FOUNDATION INVESTIGATION  
ABUTMENTS AND RETAINING WALLS  
2704.02

SQUAD NO. 9  
JOB NO. 111.  
SHEET NO. 1 OF 1 SHEETS

PARITY STOP O FLOW PROGRAM  
% STOP SWITCHES 1,2,3,4 OFF

| COL        | 1011                      | 2021                          | 3031                       | 4041                          | 5051  | 6061                     | 70                            |
|------------|---------------------------|-------------------------------|----------------------------|-------------------------------|---|--------------------------|-------------------------------|
| CARD NO. 1 | AT                        | BT                            | CT                         | DT                            | ET  | BAT                      | PROB                          |
|            | NO. PILES - ROW 1         | NO. PILES - ROW 2             | NO. PILES - ROW 3          | NO. PILES - ROW 4             | NO. PILES - ROW 5   | NO. ROWS OF BATTER PILES | PROBLEM IDENTIFICATION NO.    |
|            | 2.0                       | 1.0                           | 0.0                        | 0.0                           | 1.0   | 2.0                      | 111                           |
|            | E1                        | CX                            | DX                         | EX                            | BX  | E2                       | POLL                          |
| CARD NO. 2 | TOE TO C.L. ROW 1         | TOE TO C.L. ROW 2             | TOE TO C.L. ROW 3          | TOE TO C.L. ROW 4             | TOE TO C.L. ROW 5   | HEEL TO ROW 5            | ALLOW. HORIZ. LOAD / PILE     |
|            | Feet                      | Feet                          | Feet                       | Feet                          | Feet  | Feet                     | Kips                          |
|            | 1.75                      | 4.92                          | 0.0                        | 0.0                           | 11.25   | 1.75                     | 8.0                           |
|            | Z J                       | Z V                           | HFI                        | SPIT                          | VERT.   | CTR                      |                               |
| CARD NO. 3 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT | SPACING BETWEEN PILES - ROW 1 | VERT.  |                          | NO. OF CARDS AFTER CARD NO. 3 |
|            | Foot - Kips               | Kips                          | Kips                       | Feet                          |   |                          |                               |
|            | 126.38                    | 28.52                         | 12.95                      | 3.17                          | 3.0   | 2.0                      |                               |
|            | Z J                       | Z V                           | HFI                        |                               |   |                          |                               |
| CARD NO. 4 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |   |                          |                               |
|            | Foot - Kips               | Kips                          | Kips                       |                               |   |                          |                               |
|            | 135.0                     | 30.0                          | 11.0                       |                               |   |                          |                               |
|            | Z J                       | Z V                           | HFI                        |                               |   |                          |                               |
| CARD NO. 5 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |   |                          |                               |
|            | Foot - Kips               | Kips                          | Kips                       |                               |   |                          |                               |
|            | 150.0                     | 35.0                          | 15.0                       |                               |   |                          |                               |
|            | Z J                       | Z V                           | HFI                        |                               |   |                          |                               |
| CARD NO. 6 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |   |                          |                               |
|            | Foot - Kips               | Kips                          | Kips                       |                               |   |                          |                               |
|            |                           |                               |                            |                               |   |                          |                               |
|            | Z J                       | Z V                           | HFI                        |                               |   |                          |                               |
| CARD NO. 7 | MOMENT ABOUT TOE PER FOOT | TOTAL VERTICAL FORCE PER FOOT | TOTAL HORIZ FORCE PER FOOT |                               |   |                          |                               |
|            | Foot - Kips               | Kips                          | Kips                       |                               |   |                          |                               |
|            |                           |                               |                            |                               |   |                          |                               |
|            | Z J                       | Z V                           | HFI                        |                               |   |                          |                               |

Cards 4,5,6 and 7 are for additional loading conditions. If moments and forces are reduced, for cases when overstresses are permitted, this reduction must be kept in mind when studying the output of this program.





# SAMPLE PROBLEM-OUTPUT

C SAMPLE OUTPUT

C

C

111.000

111.000

|       |       |      |      |       |       |         |
|-------|-------|------|------|-------|-------|---------|
| 2.000 | 1.000 | .000 | .000 | 1.000 | 2.000 | 111.000 |
|-------|-------|------|------|-------|-------|---------|

|       |       |      |      |        |       |       |
|-------|-------|------|------|--------|-------|-------|
| 1.750 | 4.920 | .000 | .000 | 11.250 | 1.750 | 8.000 |
|-------|-------|------|------|--------|-------|-------|

|         |        |        |       |       |       |
|---------|--------|--------|-------|-------|-------|
| 126.380 | 28.520 | 12.950 | 3.170 | 3.000 | 2.000 |
|---------|--------|--------|-------|-------|-------|

111.000

111.000

## MAX.VERTICAL PILE LOAD IN KIPS

| PMAX  | ROW 1 | ROW 2 | ROW 3 | ROW 4 | ROW 5 |
|-------|-------|-------|-------|-------|-------|
| 52.52 | 49.83 | 45.20 | .00   | .00   | 35.95 |

| HOR.RESIST. | EXT.HORIZ. | C.G. | ECC. |
|-------------|------------|------|------|
|-------------|------------|------|------|

| PILE GROUP | FORCE | PILE GROUP |      |
|------------|-------|------------|------|
| KIPS       | KIPS  | FEET       | FEET |
| 80.28      | 82.10 | 4.91       | .486 |

111.000



# SAMPLE PROBLEM-OUTPUT

111.000

|         |        |        |       |        |       |         |
|---------|--------|--------|-------|--------|-------|---------|
| 2.000   | 1.000  | .000   | .000  | 1.000  | 2.000 | 111.000 |
| 1.750   | 4.920  | .000   | .000  | 11.250 | 1.750 | 8.000   |
| 135.000 | 30.000 | 11.000 | 3.170 | 3.000  | 1.000 |         |
| 111.000 |        |        |       |        |       |         |
| 111.000 |        |        |       |        |       |         |

## MAX.VERTICAL PILE LOAD IN KIPS

| PMAX  | ROW 1 | ROW 2 | ROW 3 | ROW 4 | ROW 5 |
|-------|-------|-------|-------|-------|-------|
| 54.52 | 51.73 | 47.54 | .00   | .00   | 39.19 |

HOR.RESIST. EXT.HORIZ. C.G. ECC.

| PILE GROUP | FORCE | PILE GROUP |      |
|------------|-------|------------|------|
| KIPS       | KIPS  | FEET       | FEET |
| 82.33      | 69.74 | 4.91       | .417 |

111.000

111.000

|         |        |        |       |        |       |         |
|---------|--------|--------|-------|--------|-------|---------|
| 2.000   | 1.000  | .000   | .000  | 1.000  | 2.000 | 111.000 |
| 1.750   | 4.920  | .000   | .000  | 11.250 | 1.750 | 8.000   |
| 150.000 | 35.000 | 15.000 | 3.170 | 3.000  | .000  |         |





# SAMPLE PROBLEM-OUTPUT

111.000

111.000

## MAX.VERTICAL PILE LOAD IN KIPS

| PMAX  | ROW 1 | ROW 2 | ROW 3 | ROW 4 | ROW 5 |
|-------|-------|-------|-------|-------|-------|
| 66.25 | 62.85 | 55.46 | .00   | .00   | 40.71 |

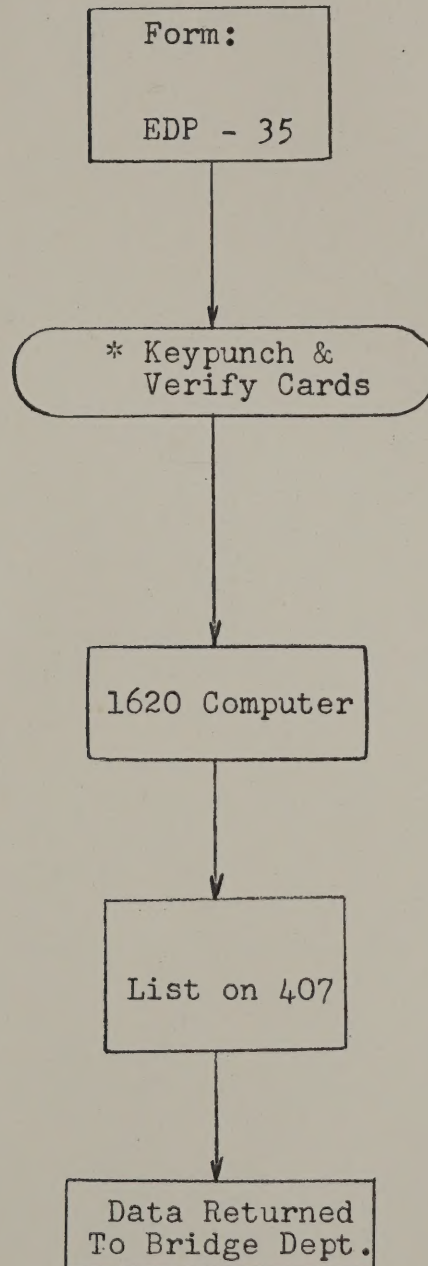
| HOR.RESIST. | EXT.HORIZ. | C.G. | ECC. |
|-------------|------------|------|------|
|-------------|------------|------|------|

| PILE GROUP | FORCE | PILE GROUP |
|------------|-------|------------|
|------------|-------|------------|

| KIPS  | KIPS  | FEET | FEET |
|-------|-------|------|------|
| 92.39 | 95.10 | 4.91 | .631 |

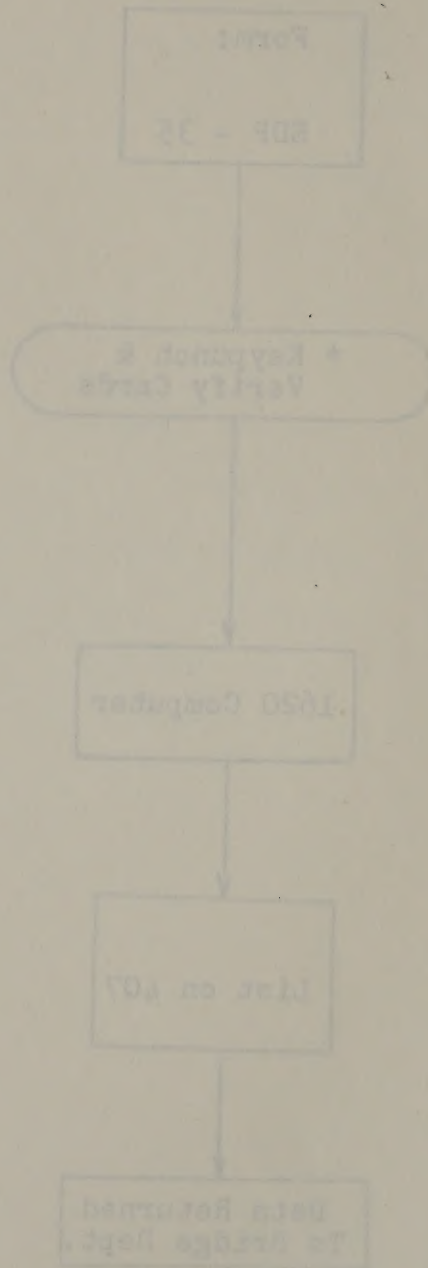


## SEQUENCE OF OPERATIONS



\* Card Handling, key punch and computer instructions are available.

# SEQUENCE OF OPERATIONS



\* Card handling, key punch and computer instructions are

available.





**00300**



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